

Missouri Interoperability Initiatives

2011 Missouri Interoperability
Conference

February 9-10, 2011

Multi Vendor Project 25

Subscriber Units

- Missouri DPS, in conjunction with the Missouri SIEC is developing criteria for multi-vendor subscribers to access the MOSWIN network.
- A minimum number of elements, including field testing to ensure the device can operate effectively with “real world” functionality, are required for certification on the system.

Multi Vendor Project 25 Subscriber Units, Cont.

- Devices must operate throughout the 138-174 MHz VHF High Band
- Devices must have a maximum transmitter power output of 50 watts
- Devices must be capable of operating in the Project 25 Trunked Mode (Phase 1 FDMA)
- Project 25 radios operating on MOSWIN must utilize, at a minimum, the IMBE (Baseline) P 25 vocoder.
- The AMBE + 2 vocoder is the **preferred** Project 25 vocoder for use in the MOSWIN network. (improved audio, TDMA,etc)
- Devices must contain a 128 Control Channel Capacity (Minimum)
- Devices should have 512 available channels/modes (Minimum)
- Device should have a roaming algorithm that takes into consideration Receive Signal Strength Indicator (RSSI) and Adjacent Site System Information.

Multi Vendor Project 25 Subscriber Units, Cont.

- Device should be able to scan for Control Channels, including adjacent site Control Channels, across the full range of the VHF High Band spectrum radio (138-174 MHz).
- Device must be capable of having a “preferred” system site list established for specific radios operating within defined areas. This is necessary to manage system capacity.
- Device must utilize a “System Key” or other technology that allows MOSWIN system administration to confirm, via the network, that the subscriber unit is a valid, authorized subscriber and that it should be permitted access to the system.
- Device must be capable of Advanced Project 25 Control Channel functionality that enables *explicit* trunking.

Missouri Interoperability Channel Whitepaper

- Through the Missouri SIEC, a whitepaper has been introduced outlining interoperability channels and how they are utilized in Missouri on a *discipline specific* basis and on a *multi-discipline* basis.
- The whitepaper provides users the FCC designated interoperability channels, their use and their National Interoperability Common Channel Nomenclature names so they can program the channel names into their radios.
- The list of channels includes the Missouri agencies that are responsible for administering the specific channels.
- NIFOG Vs. MOFOG

Receive MHz	Transmit MHz	Eligible Usage (Base-Mobile-Fixed)	Primary Use	National Common Name	Missouri Authority	FCC Limitations
155.7525	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VCALL10	N/A	90.20 (80,83)
151.1375	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VTAC11	N/A	90.20 (80)
154.4525	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VTAC12	N/A	90.20 (80)
158.7375	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VTAC13	N/A	90.20 (80)
159.4725	SIMPLEX	Base-Mobile-Fixed	Any Public Safety Eligible	VTAC14	N/A	90.20 (80)

Interoperable channels

Fire

- 154.265
- 154.2725
- 154.280
- 154.2875
- 154.295
- 154.3025
 - Administered by State Fire Marshall

Law

- 155.475
- 155.4825
 - Administered by MSHP

Interoperable channels

EMS

- 155.340
- 155.3475

VTAC National Channel Pairings

- Recently DHS recommended temporary fixed use of VTAC channels as VHF repeater pairs
- VTAC 11/VTAC14
- And
- VTAC 13/VTAC 13

Missouri Tactical Channel

154.680 MHz

FIXED

- Each Missouri PSAP/Communications facility can have access to the simplex MTAC channel from their facility.
- MOU for fixed use with operational usage criteria has been distributed via MOSIEC list-serve and will be finalized Feb 17th
- MTAC narrowband by March 1, 2012

MOBILE

- Mobile use of MTAC continues as multi-discipline calling channel.
- Narrowband of MTAC set for March 1, 2012.



MOSWIN

**Missouri Statewide
Interoperability Network
Stephen Devine
*Missouri Dept of Public
Safety***

What is it?



A **statewide** radio system for:

- **State agencies**
- **County agencies**
- **Local agencies**

Fire - Law Enforcement – EMS

PSAPS

Emergency Management

Others



Two Co-Primary Requirements for The MOSWIN System

STATE AGENCIES

- To provide statewide, internal communications (operability) for a number of state agencies removing aging stovepipe, disparate radio systems and providing a consistent platform for state agencies to operate on.

LOCAL AGENCIES

- To provide an interoperable “platform” for local agencies to talk to each other and to the State. System places radios accessing the system in each PSAP and Communications Center in Missouri (206) to allow for interoperable access to MOSWIN.

Incremental Interoperable Access to MOSWIN

STATE AGENCIES

- Some state agencies will utilize the system on a full time basis and it will support their entire day-day operation.
- Other state agencies will utilize the system as a *supplement* to their existing communications resources.

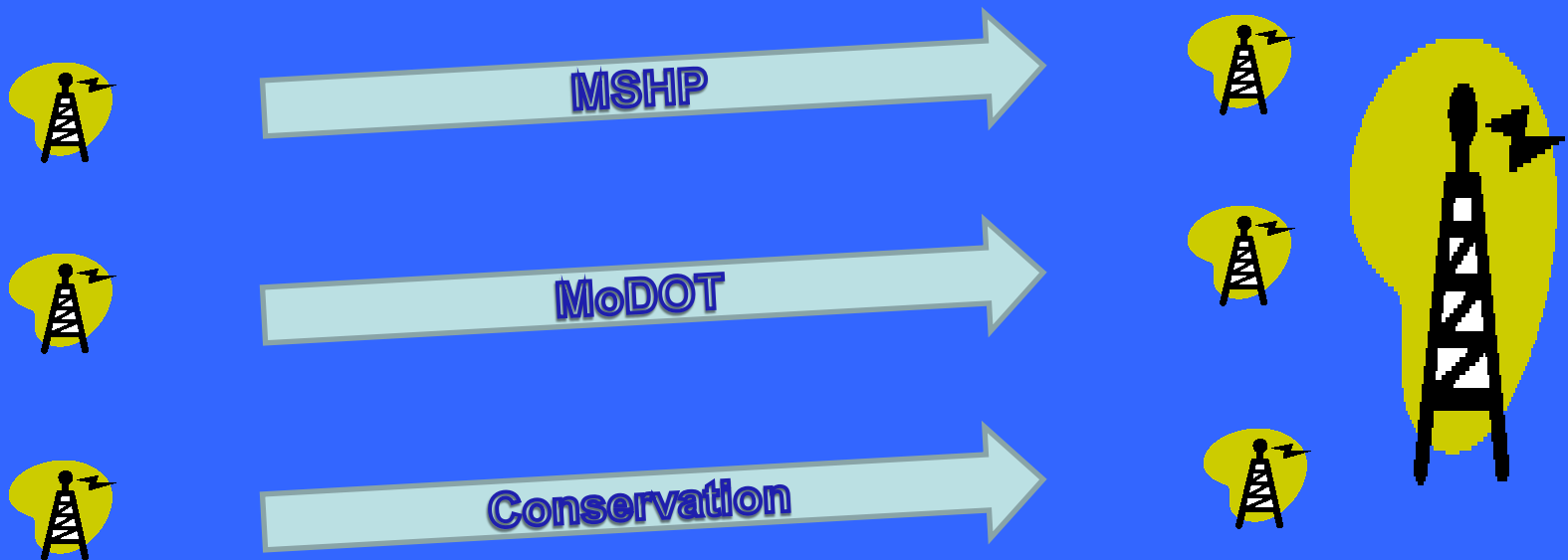
LOCAL AGENCIES

- Many local agencies will access the MOSWIN network for interoperable needs as a *supplement* their interoperable needs while retaining their existing agency based communications.
- Other local agencies will utilize the system for all their communications needs.

Why We Need It



State Agencies with Wide Area Coverage



Users cannot talk across each others systems covering the same geographic area and can't access needed multi-agency interoperability, in real time..

Why We Need It



Local Agencies with Local Coverage



Current systems and disciplines can't talk to each other as needed during mission critical incidents.

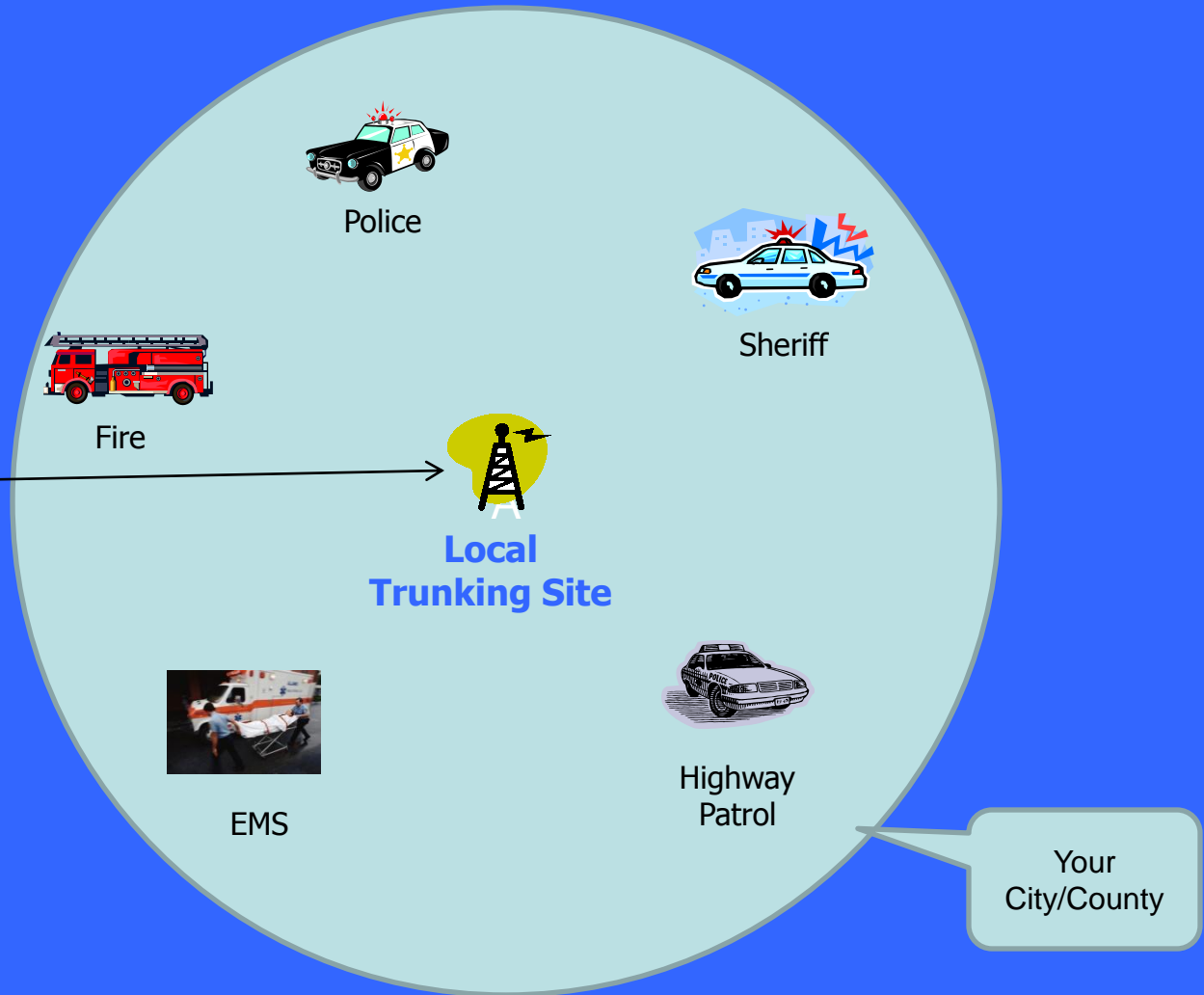
Why We Need It

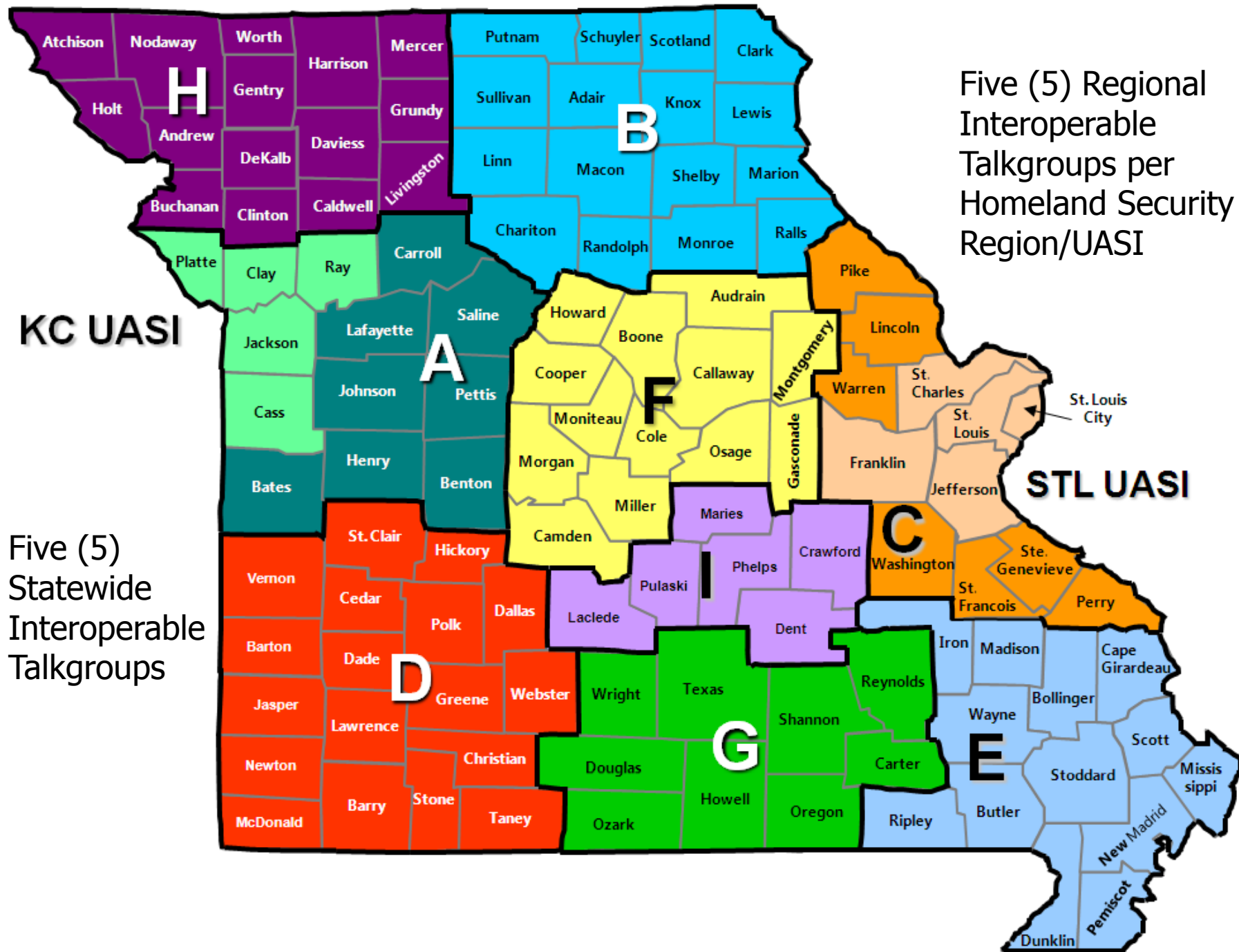
Interoperability

Local agencies can talk to one another and to state agencies



If you're on the network *anywhere*, you're on the network *everywhere..*





System Architecture

System contains 71 RF sites

Two Master Site Controllers

Covers 69,000 Square Miles of Missouri

Provides 95% Mobile Coverage with A DAQ of 3.4 in each of Missouri's 115 Counties.

Mobile Coverage = 50 watt radio with 2 M antenna

State users will have dual band subscriber radios (mobile/portable) to access rural and urban area radio systems.



95 % Mobile Coverage

3.4 Delivered Audio Quality (DAQ)

3.4 DAQ indicates threshold of digital signal that is of a high quality and provides superior audio.

3.4 DAQ indicates no more than 2% BER (Bit Error Ratio) degradation in the signal.

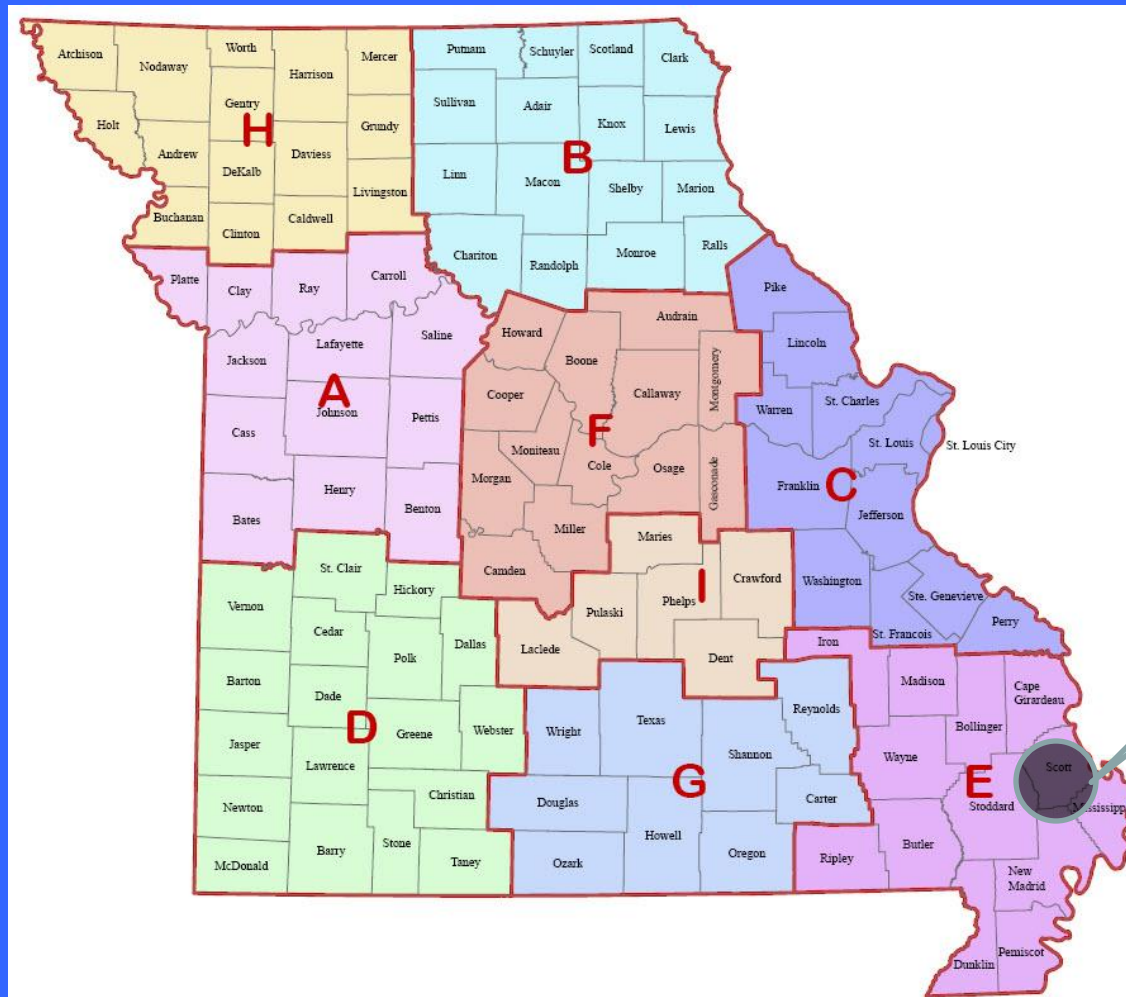
LOCAL AGENCIES

- For radios modulated by digital signals, bit error ratio (BER) is analogous to an analog FM radio's SINAD ratio.
- Typically, P25 manufacturers specify 5% BER as a minimum performance level.

SINAD (dBs)	2.5 KHz Deviation Analog FM Receiver reference Sensitivity Level (dBm)	Objective DAQ Score (Analog FM)	TIA- Reported DAQ Scores (Analog FM)	BER (%)	P 25 Digital Receiver Reference Sensitivity Level (dBm)	Objective DAQ Score (Digital C4 FM)	TIA Reported DAQ Scores (digital C4FM)
35	-87	4.4		0.25	-115.1	3.6	
30	-103	3.8		0.5	-116	3.7	
25	-109.5	3.1	4	1	-117.6	3.6	4
22.3	-111	2.6		1.4	-118.2	3.7	
20	-113.5	2.3	3.4	2	-119	3.6	3.4
17	-116.5	2	3	2.6	-119.6	3.6	3
15.3	-118.2	1.8		3.2	-120.1	3.5	
13.5	-119.9	1.6		4.2	-120.8	3.2	
12	-120.5	1.6	2	5	-121.4	3.1	2
10	-121.5	1.4		8.5	-123.1	1.7	
6	-123.5	1.3		12.5	-124.7		

Source: NTIA Report 99-3158 *Delivered Audio Quality Measurements of Project 25 Land Mobile Radios*, November 1998

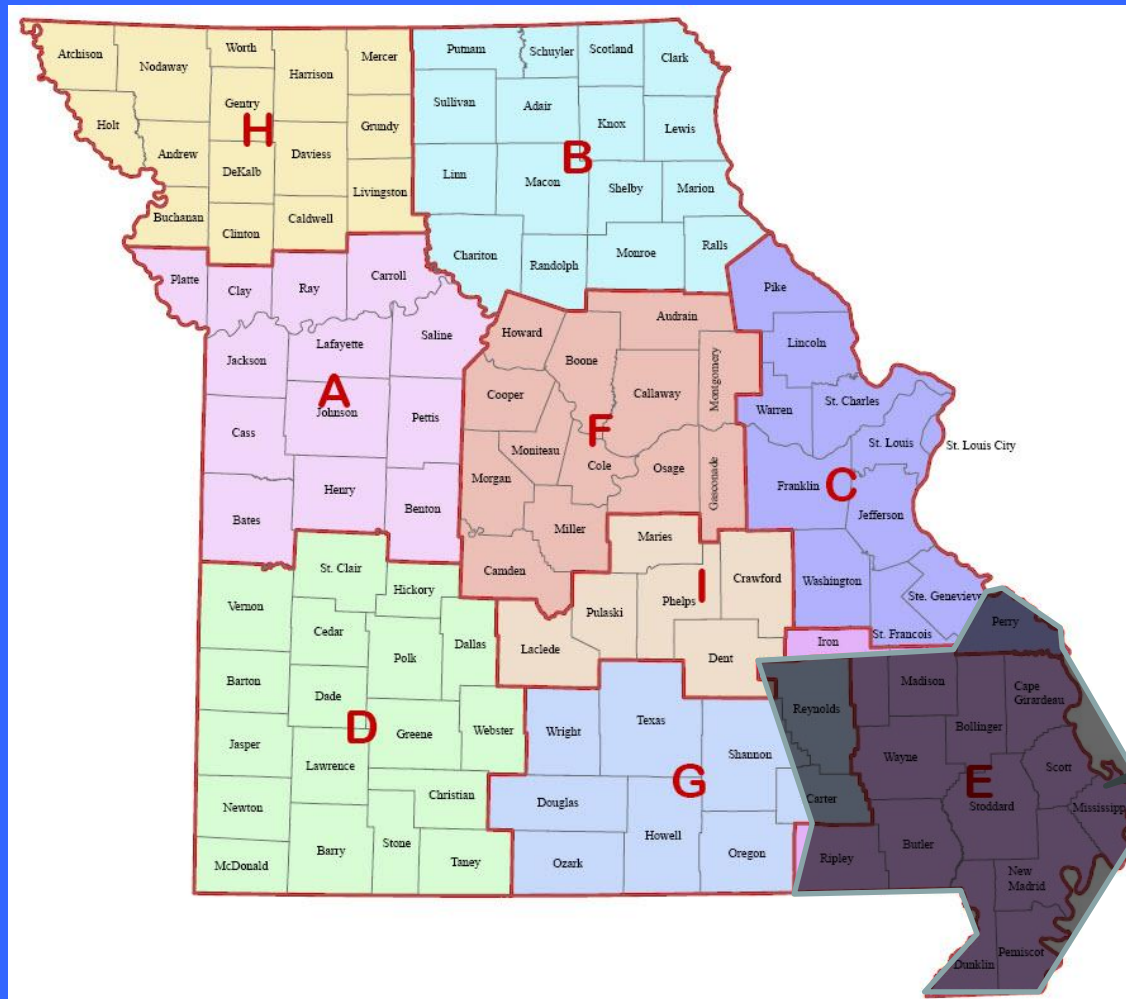
Pilot Project



City of
Sikeston
and
Local
area
MSHP

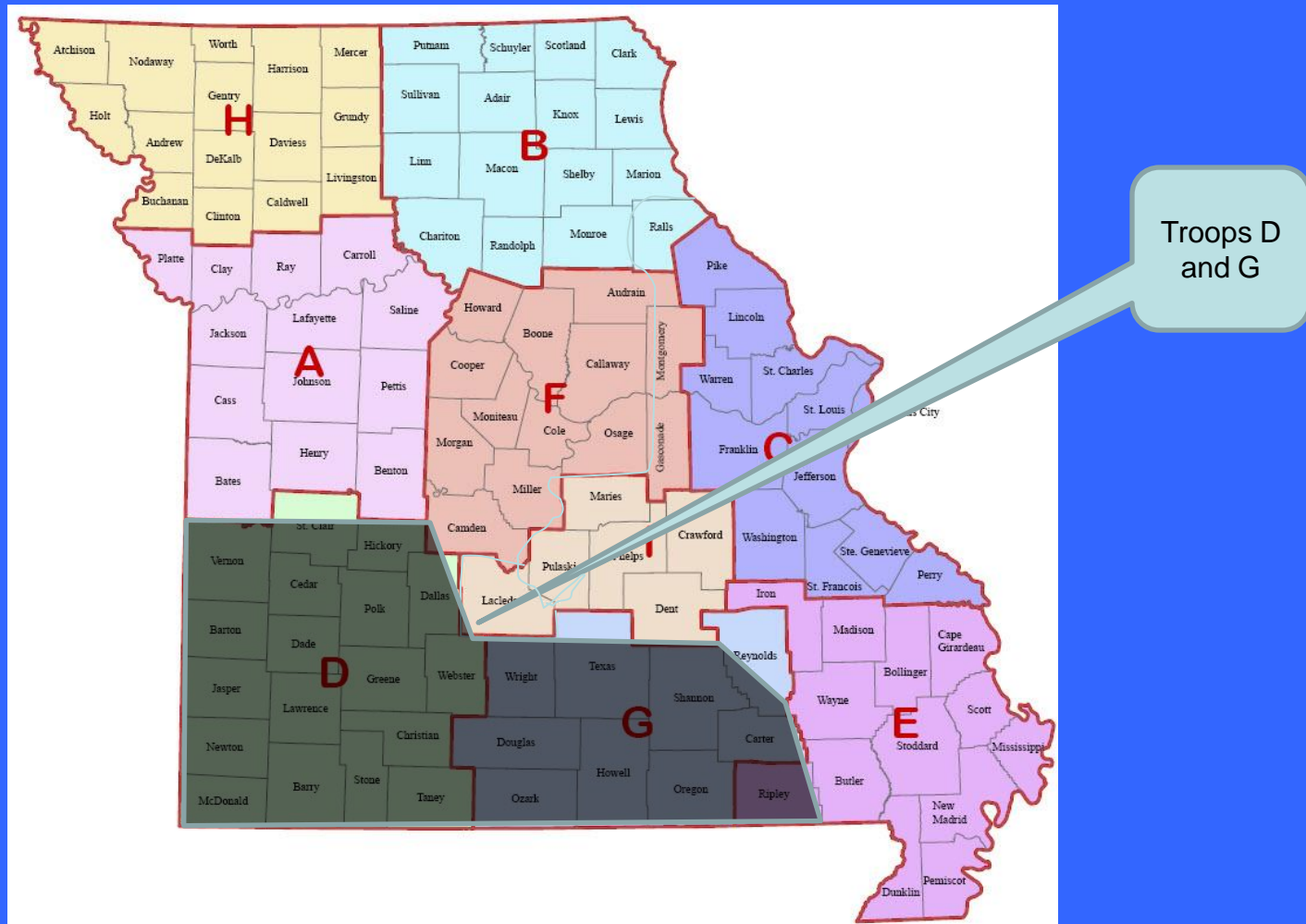
Highlighted area is approximate coverage area

Phase 1 Buildout



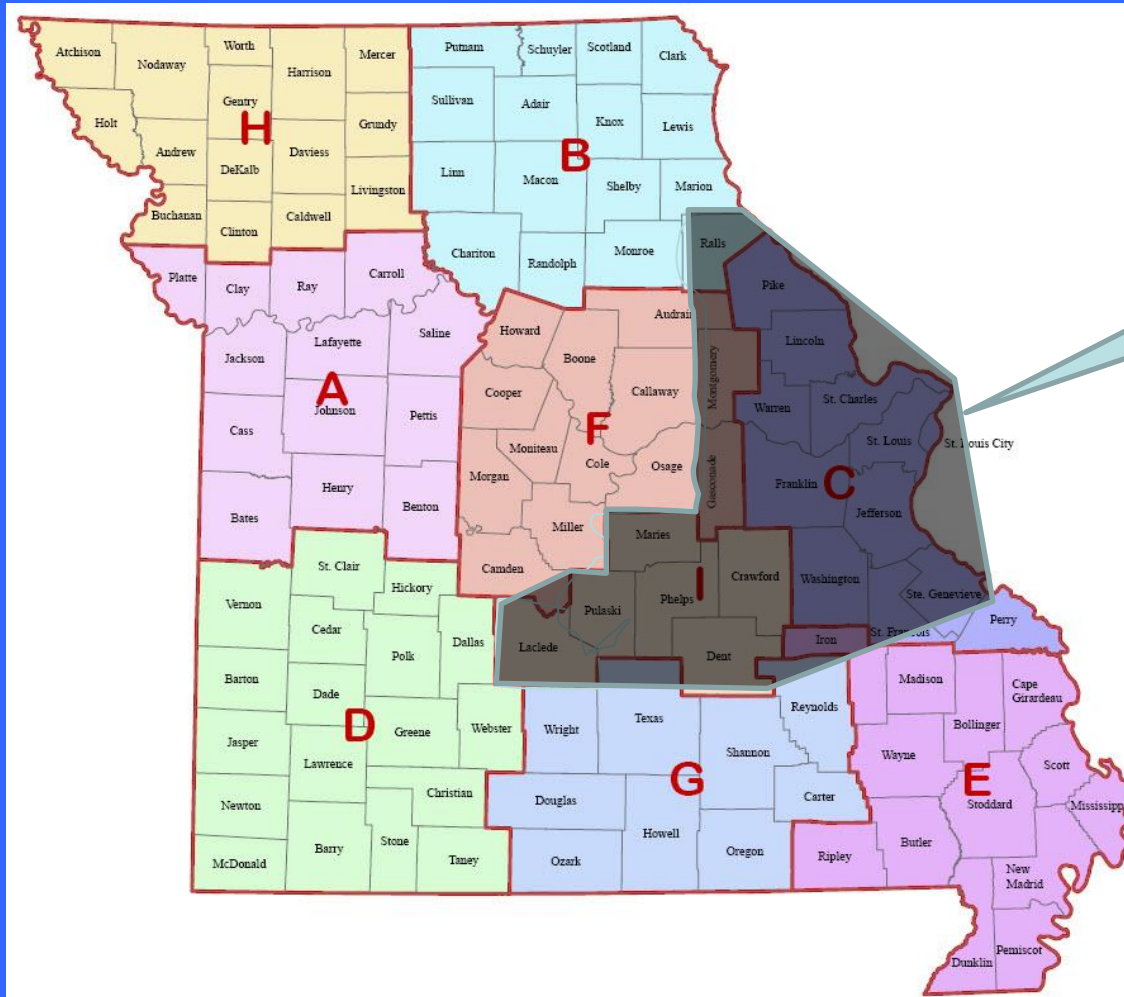
Highlighted area is approximate coverage area

Phase 2 Buildout



Highlighted area is approximate coverage area

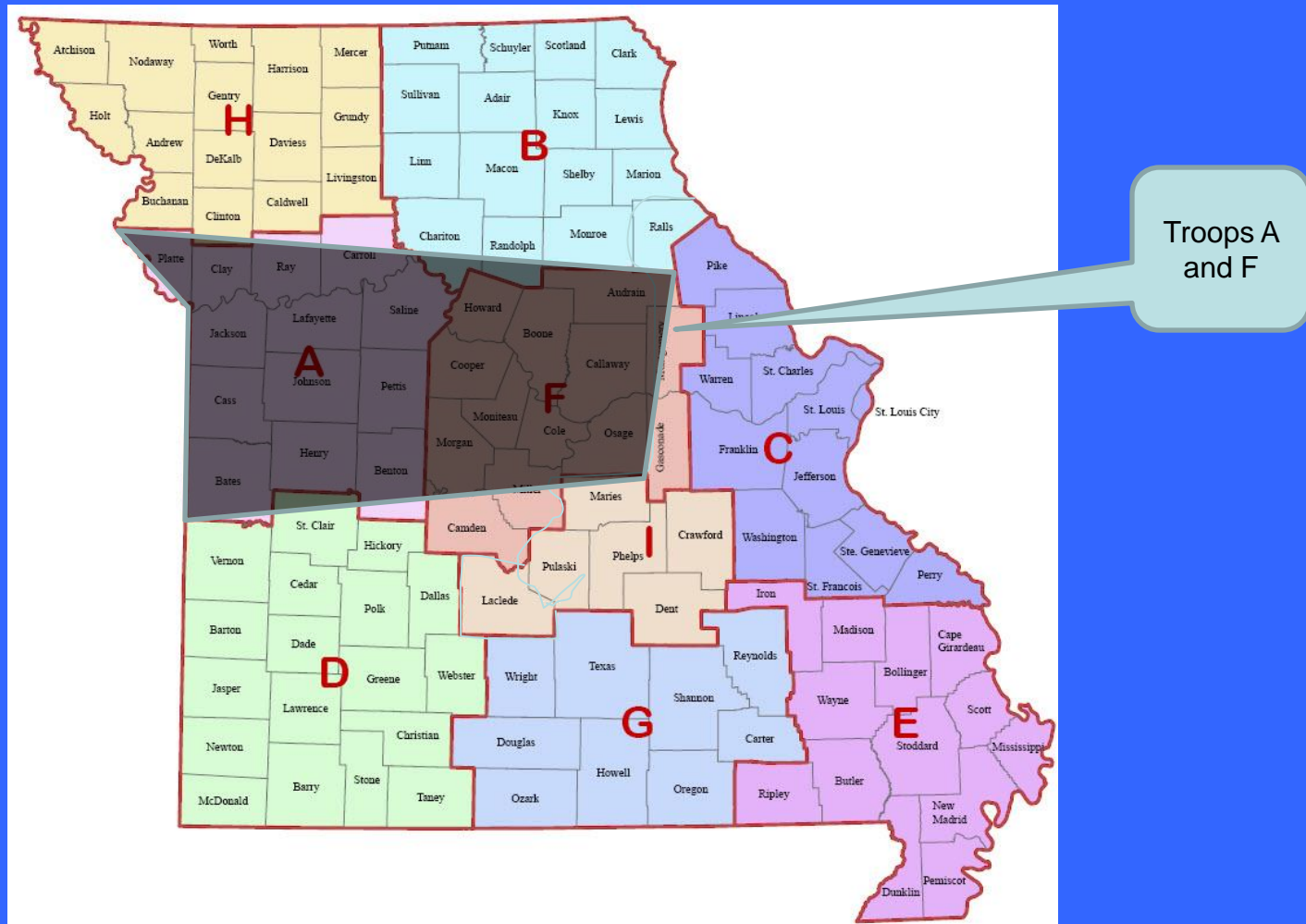
Phase 3 Buildout



Troops
C, I, and
portions
of F,B,G

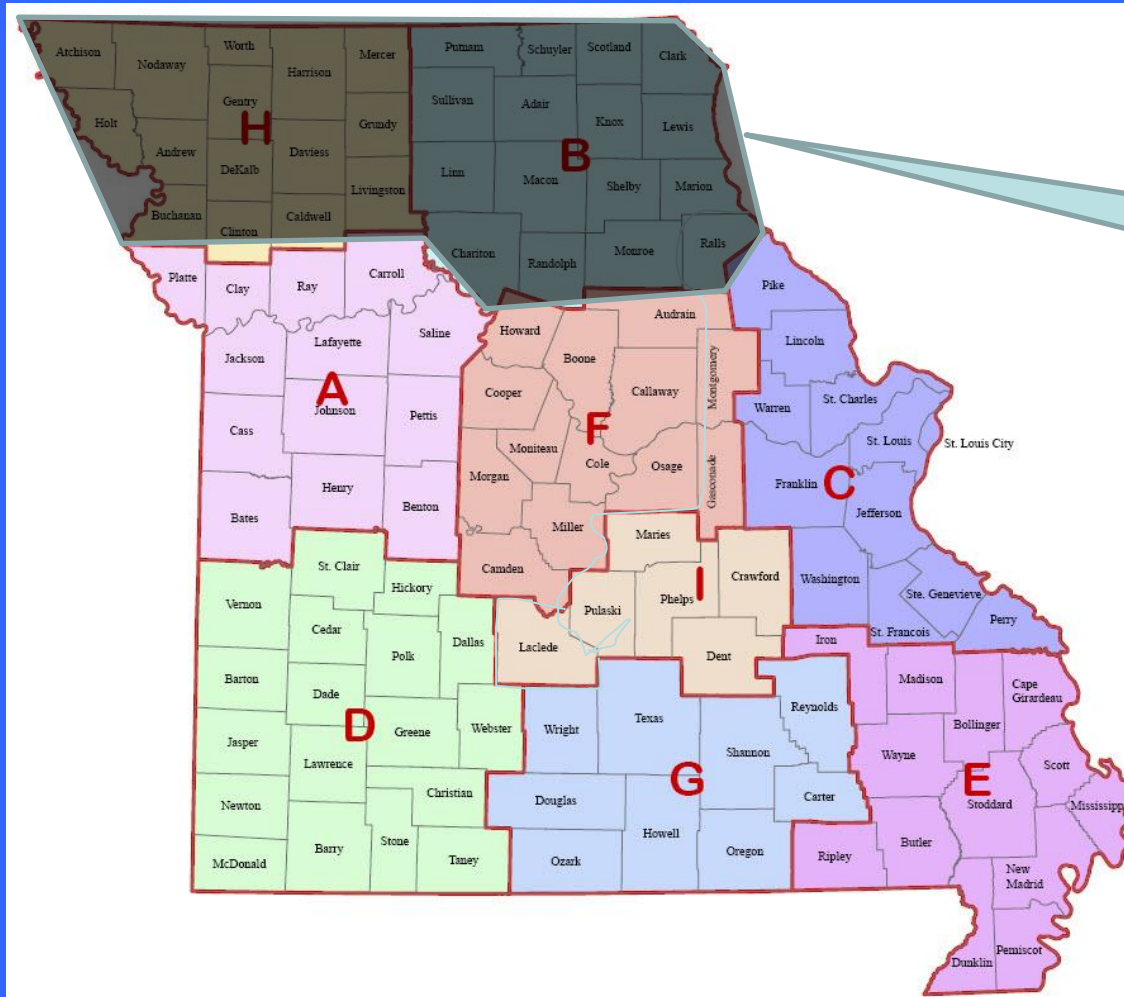
Highlighted area is approximate coverage area

Phase 4 Buildout



Highlighted area is approximate coverage area

Phase 5 Buildout



Troops H and B

Highlighted area is approximate coverage area



PSAP/Communication Center Control Stations

207 Facilities in Missouri are signed up to receive 6 Meter Control Stations to operate and on the MOSWIN network. Baseline Interoperability Suite will consist 5 regional talkgroups and 5 Statewide Talkgroups.



MOSCAP Program

What is it?

MOSCAP

- MOSCAP is a grant program that allows local agencies to offer communications assets it controls to the MOSWIN network in exchange for grant funds and agency's gaining access to the network.
- It allows a dialogue to continue between state and local agencies regarding their interoperable needs through MOSWIN.

Questions

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